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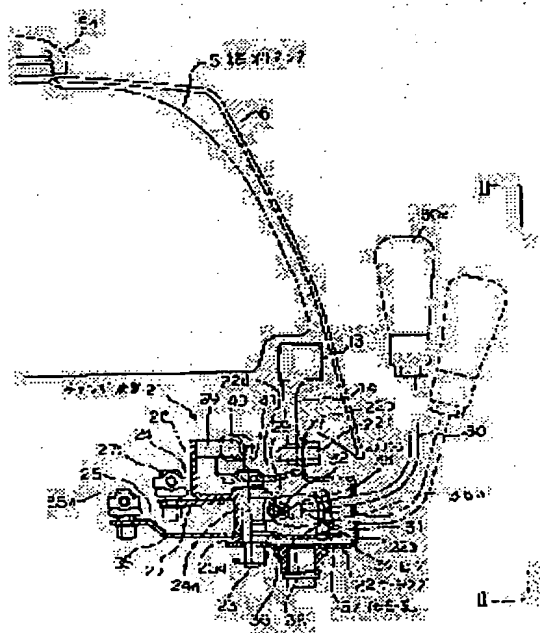
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## (54) SPEED CHANGE DEVICE FOR VEHICLE TRAVELING ON ROUGH GROUND

## (57)Abstract:

PURPOSE: To provide a speed change device for a vehicle traveling on the rough ground, allowing a concurrent selection between a forward travel mode and a backward travel mode, and a changeover from a high-speed gear to a low-speed gear or vice versa, with a single lever.

CONSTITUTION: A boss section 24a forming a part of operation section of a first lever mechanism 24 for selecting forward travel, neutral and backward travel modes in a standard gear, and another boss section 25a as part of a second lever mechanism 25 for changing over the standard gear to a high-speed gear are kept adjacent to each other around a fixed shaft 23, with the boss section 24a of the mechanism 24 kept at an upper position. Also, boss sections 24a and 25a are coupled so as to be rotatable independently, and the base end of a shift lever 30 is vertically held on and connected to the boss section 24a rotatably. The end of the shift lever 30 is energized upward with a spring 33, and a vertical engagement pin 34 is secured to the base of the lever 30. In addition, an engagement hole 37 for allowing insertion of the pin 34 is formed on an arm 36 extended from the boss section 25a of the mechanism 25.



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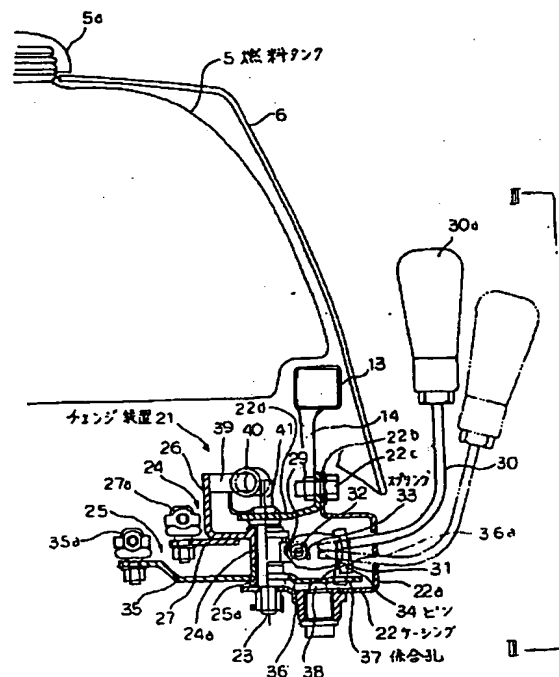
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(54) 【発明の名称】 不整地走行車のチェンジ装置

(57) 【要約】

【目的】 1本のレバーで前後進の切換と高速段又は低速段への切換とを同時に行える不整地走行車のチェンジ装置を提供する。

【構成】 固定シャフト23の外周には、標準段において前進・中立・後退を切換を行うための第1レバー機構24の操作部の一部を構成するボス部24aと、標準段から高速段への切換を行うための第2レバー機構25の操作部の一部を構成するボス部25aとを、第1レバー機構24のボス部24aを上側にして相互に隣接させ、かつそれぞれ独立して回転可能に嵌装し、ボス部24aにチェンジレバー30の基端部を垂直方向に回転可能に枢支連結するとともに、スプリング33を介してチェンジレバー30の先端側を上方へ付勢し、チェンジレバー30の基部に縦向きの係合ピン34を固着し、第2レバー機構25のボス部25aから延設したアーム36に、係合ピン34が挿入可能な係合孔37を設けている。



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## 【特許請求の範囲】

【請求項1】 前進・中立・後退の標準段における切換と、該標準段と高速段又は低速段との切換とを、1本のチェンジレバーにより操作可能にした不整地走行車のチェンジ装置であって、

前記標準段において切換を行うための第1レバー機構と、前記高速段又は低速段との切換を行うための第2レバー機構とをそれぞれ独立して設け、

前記第1レバー機構にチェンジレバーを連結するとともに、このチェンジレバーを中立段において前進および後進への切換方向とほぼ直角方向に操作することによって、前記第1レバー機構と前記第2レバー機構とが結合され、第2レバー機構が操作可能になり標準段から高速段又は低速段への切換ができるように構成したことを特徴とする不整地走行車のチェンジ装置。

【請求項2】 前記第1レバー機構と前記第2レバー機構とを同軸上でそれぞれ独立して回転可能に配設し、前記チェンジレバーを第1レバー機構の操作部に対し第1レバー機構の切換方向と直角方向に回動可能に取り付け、対をなす係合部の一方を前記チェンジレバーの基部に設けるとともに、係合部の他方を前記第2レバー機構の操作部に前記一方の係合部に相対向して設けた請求項1記載の不整地走行車のチェンジ装置。

【請求項3】 固定シャフトの外周に、前記第1レバー機構の操作部の一部を構成するボス部と前記第2レバー機構の操作部の一部を構成するボス部とを、相互に隣接させかつそれぞれ独立して回転可能に被装し、

前記第1レバー機構のボス部に前記チェンジレバーの基端部を前進および後進への切換方向とほぼ直角方向に回転可能に枢支連結するとともに、スプリングを介してチェンジレバーの先端側を前記直角方向へ付勢し、

前記チェンジレバーの基部に凸状係合部を固着し、第2レバー機構の前記ボス部から延設したアームに、中立段で前記チェンジレバーを前記スプリングに抗する方向に操作したときに前記凸状係合部が挿入される凹状係合部を設け、この状態でチェンジレバーを前記第2レバー機構の切換方向に回転操作するとき、前記第1レバー機構と前記第2レバー機構とが一体的に回転するようにした請求項1又は2記載の不整地走行車のチェンジ装置。

【請求項4】 鞍乗型シート前方に配置された燃料タンクの前方にバーハンドルを備えとともに、このバーハンドルの一方にハンドブレーキレバーを配置した鞍乗型四輪バギー車において、

その燃料タンクを支持するフレームにブラケットを介して、前記燃料タンクの下から前記ハンドブレーキレバーと反対側へ前記チェンジレバーの先端部分を張り出させて取り付けけた請求項1～3のいずれかに記載の不整地走行車のチェンジ装置。

## 【発明の詳細な説明】

【0001】

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【産業上の利用分野】 この発明は、荒れ地等を走行可能な鞍乗型四輪バギー車や農業用運搬車などの不整地走行車に好適なチェンジ装置に関し、詳しくは、前進・中立・後退の標準段における切換と、該標準段と高速段又は低速段との切換とを、1本のチェンジレバーにより操作可能にした不整地走行車のチェンジ装置に関するものである。

【0002】

【従来の技術】 この種のチェンジ装置に、例えば実開昭63-103118号公報に記載の装置がある。この装置は、インターロック装置を設けることなく、チェンジレバーを前進・中立・後退の各位置に位置決めできるようにしたもので、縦向きクランク形のガイド孔に挿通されたレバーを、ガイド孔の屈曲部でスプリングにて一側方に付勢した構造からなる。

【0003】 上記チェンジ装置が装備される不整地走行車には、普通はベルト式などの簡易な自動変速機が搭載されているので、例えば、チェンジレバーの前進位置での走行に際し、走行速度の変化に従って自動的に減速比が変更される。しかし、自動変速機だけによる減速比では最高速度が低く抑えられたり、逆に高速になり過ぎたりするため、一般にはチェンジ装置とは別に、標準段から高速段又は低速段への切換装置が装備されている。

【0004】

【発明が解決しようとする課題】 しかしながら、上記公報に記載のチェンジ装置では、以下のような不都合がある。

【0005】 ① 高速段又は低速段への切換装置（以下、第2レバー機構ともいう）の取付場所が、標準段における前後進の切換装置（以下、第1レバー機構ともいう）とは別に必要になる。

【0006】 ② 第2レバー機構には、チェンジレバー方式やスイッチ方式等があるが、いずれの方式の場合にも、第1レバー機構のレバー操作とは別個に操作する必要があるため、操作上不便である。

【0007】 この発明は上述の点に鑑みなされたもので、1本のレバーで前後進の切換と高速段又は低速段への切換とを同時に行え、しかも構造が簡単な、不整地走行車のチェンジ装置を提供することを目的としている。

【0008】

【課題を解決するための手段】 上記の目的を達成するために本発明にかかる不整地走行車のチェンジ装置は、

a) 前進・中立・後退の標準段における切換と、該標準段と高速段又は低速段との切換とを、1本のチェンジレバーにより操作可能にした不整地走行車のチェンジ装置であって、  
b) 前記標準段において切換を行うための第1レバー機構と、前記高速段又は低速段との切換を行うための第2レバー機構とをそれぞれ独立して設け、  
c) 前記第1レバー機構にチェンジレバーを連結するとともに、このチェンジレバーを中立段において前進および後進への

操舵される。パーハンドル7の左側にパーキングブレーキレバー9、右側にリヤブレーキレバー10がそれぞれ取り付けられている。また燃料タンク5の下方にエンジン11が搭載され、このエンジン11の一方にフットブレーキペダル12が設けられている。なお、図中の符号2aはリヤフェンダー、8aはフロントフェンダー、5aはタンクキャップである。また30は後述するチェンジ装置21(図2)のチェンジレバー、22aはレバーカバーである。

【0019】図2に示すように、本例のチェンジ装置21はレバーカバー22aを兼ねた断面略コの字形のケーシング22を備え、このケーシング22の上端縁部22bが燃料タンク5を支持するフレーム13に、ブラケット14およびボルト・ナット22cを介して取り付けられている。ケーシング22の開放側下端部とブラケット14にボルト・ナット22cを介して取り付けられた支持プレート22dの解放側間に、固定シャフト23が垂直に固設されている。この固定シャフト23の外周には、標準段において前進・中立・後退を切換を行うための第1レバー機構24の操作部の一部を構成するボス部24aと、標準段から高速段への切換を行うための第2レバー機構25の操作部の一部を構成するボス部25aとを、第1レバー機構24のボス部24aを上側にして相互に隣接させ、かつそれぞれ独立して回転可能に嵌装している。

【0020】第1レバー機構24のボス部24aの上端部に、L形ブラケット26が溶接され、ブラケット26の屈曲部下面にアーム27が一体に溶接されている。アーム27の外側端部に、タイロッド又はケーブルの取付具27aの下端部が水平回転自在に装着されている。ボス部24aのアーム27と反対側面には、ブラケット29が垂直に溶接されている。グリップ30aを先端部に備え、L状に屈曲したチェンジレバー30の基端部を一体に溶接したプレート31が、横向きの枢支ピン32を介してブラケット29に対して垂直方向に回転自在に装着されている。そして、チェンジレバー30は、スプリング33を介して上方に付勢されている。また、チェンジレバー30の基端部でプレート31の近傍には、縦向きにピン34が溶接されている。

【0021】第2レバー機構25のボス部25aには、アーム27側とその反対側に延びるアーム35・36が一体に溶接されている。アーム27側のアーム35はアーム27よりも外方へ延び、その外側端部にタイロッド又はケーブルの取付具35aの下端部が水平回転自在に装着されている。アーム27と反対側のアーム36の外端寄りに、図4のようにチェンジレバー30の係合ピン34を挿入可能な略三角形形状の係合孔37が穿設され、また係合孔37のやや内側のアーム36の下面に、図4のように位置決め穴36aが円周方向に間隔をあけて2つ形成されている。一方、位置決め穴36aに対応

するケーシング22の下部には、位置決めピン38(デイトントともいう)がスプリング(図示せず)により上向きに付勢され、ピン38の上端部が2つの位置決め穴36aに選択的に嵌入して第2レバー機構25を位置決めする。

【0022】図4に示すように、ブラケット26の上部に直角にプレート39が固着され、第1レバー機構24が後退位置に回転したときにプレート39に当接してONになるスイッチ40がケーシング22の上面の端部に、図2のようにU形ブラケット41を介して装着されている。このスイッチ40が入ると、バックランプが点灯したりブザー音や音声が発生したりするので、4輪バギー車1の後退を知ることができる。

【0023】図3に示すように、レバーカバー22aには、チェンジレバー30が挿通されるガイド孔43が形成されている。このガイド孔43は、本例では、中立位置の縦向きのガイド孔部43a、このガイド孔部43aの上部から右側に延びる前進位置への横向きのガイド孔部43b、ガイド孔部43aの最上部から左側に延びる後退位置への横向きのガイド孔部43c、ガイド孔部43aの最下部から右側に延びる高速段切換位置への横向きのガイド孔部43dからなる。

【0024】次に、上記のように構成される本実施例のチェンジ装置21について、その動作を説明する。

【0025】① チェンジレバー30は、その中立位置において常態では、図2のようにスプリング33により上方に付勢され、標準段に位置している。

【0026】② 運転者は、図1のブレーキレバー9を左手にて握ってブレーキを操作した状態を保ったまま、右手でチェンジレバー30をガイド孔部43bに沿って右側へ回転操作すると、標準段の前進位置に変速される。

【0027】③ ブレーキレバー9をゆっくりと緩めてブレーキを解除しながら、アクセルをゆっくりとふかして4輪バギー車1を発進させ、後はアクセルを徐々にふかすことにより、4輪バギー車1の速度が上昇する。しかし、標準段における最高速度は低いので、さらに速い速度で走行するには、次のようにして高速段に切り換える。

【0028】④ チェンジレバー30をガイド孔部43bに沿って左側へ回転操作し、中立位置に一旦戻す。そして、スプリング33に抗してチェンジレバー30をガイド孔部43aに沿って押し下げた後、ガイド孔部43dに沿って右側へ回転操作することにより、高速段の前進位置に変速される。上記③と同様の運転操作を行うことによって、高速段で4輪バギー車1を走行させることができる。

【0029】⑤ 4輪バギー車1を後退させる場合には、チェンジレバー30をガイド孔部43dに沿って元の中立位置に戻し、押し下げ力を解除することによって

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スプリング33の付勢力によりチェンジレバー30が上方の標準段の中立位置へ自動的に戻る。ここで、チェンジレバー30をやや押し上げるようにして、ガイド孔部43cに沿って左側へ回転操作すると、後退位置に変速される。

【0030】上記に、本発明のチェンジ装置の一実施例を説明したが、本発明は下記のように実施することができる。

【0031】1) チェンジ装置21の取付位置を、図5に示すように4輪バギー車1の燃料タンク5下から右側のフロントフェンダー8a内の前輪8の上方へ移し、チェンジレバー30の先端グリップ30aを後方へ突出させてもよい。

【0032】2) ガイド孔43の形状を、例えばガイド孔部43bとガイド孔部43cとが一直線状になるように変更してもよい。

【0033】3) チェンジレバー30のピン34とアーム36の係合孔37との組み合わせに代えて、チェンジレバー30の下方への揺動動作で相互に係合する部材(係合片)を設けてもよい。つまり、凸状係合部34をアーム36側に設け、凹状係合部37をチェンジレバー30に設けることができる。

【0034】4) チェンジ装置21を垂直方向において90°転回し、チェンジレバー30の上下方向の操作で前後進の切換や標準段と高速段との切換が行われるようにすることもできる。

【0035】5) 高速段に代えて低速段の変速装置を設け、第2レバー機構25を標準段から低速段の切換を行うために用いることができる。

【0036】

【発明の効果】以上説明したことから明らかなように、この発明のチェンジ装置には、次のような優れた効果がある。

【0037】(1) 1本のチェンジレバーにより、標準段と高速段又は低速段との切換および標準段における前後進の切換を同時に行うことができるので、操作が簡単でしかも確実である。

【0038】(2) 請求項2に記載のチェンジ装置では、チェンジレバーを第1レバー機構の切換方向と直角方向に回転させることにより、第1レバー機構と第2レバー

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機構とが一体的に回転可能な状態になるので、標準段から高速段あるいは低速段への切換を、標準段の前進・中立・後退の切換用チェンジレバーで行え、操作が容易で便利である。

【0039】(3) 請求項3に記載のチェンジ装置では、チェンジレバーに対しスプリングに抗する力を作用させるか否かで、標準段と高速段又は低速段との切換を行えるので、切換操作が容易でしかも正確に行える。

【0040】(4) 請求項4に記載のチェンジ装置では、運転者が着座した状態でブレーキレバーとチェンジレバーとを両手で掃除に操作して4輪バギー車をスムーズに発進させることができ、しかも、燃料タンクの下に装置の大部分を収納できるので、邪魔にならない。

【図面の簡単な説明】

【図1】本発明の実施例のチェンジ装置を装備した鞍乗型4輪バギー車を後方から見た状態を概略的に示す斜視図である。

【図2】図1のチェンジ装置の取付状態を示す中央縦断面図である。

【図3】図2のチェンジ装置のIII-III線矢視図である。

【図4】図2のチェンジ装置の平面図である。

【図5】図5はチェンジ装置の取付位置の異なる実施例を示すもので、図5(a)は4輪バギー車の右側フロントフェンダーを後方から見た状態を示す概略図、図5(b)は図5(a)のV-V線断面図である。

【符号の説明】

1 4輪バギー車(不整地走行車)

5 燃料タンク

21 チェンジ装置

22 ケーシング

23 固定シャフト

24 第1レバー機構

25 第2レバー機構

27・35・36 アーム

30 チェンジレバー

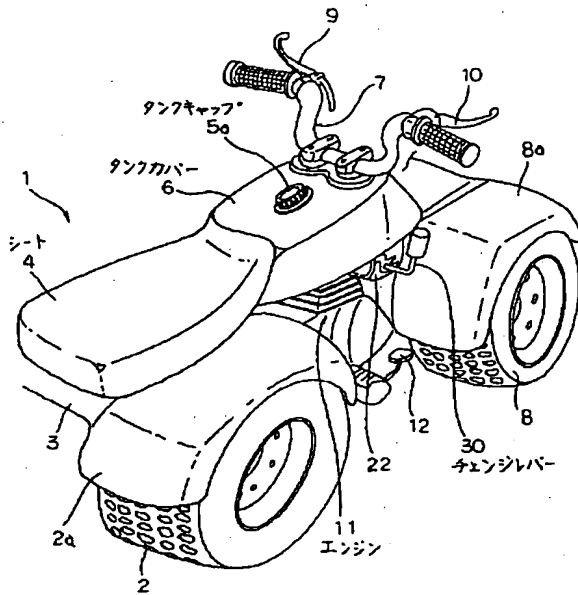
34 係合ピン(凸状係合部)

33 スプリング

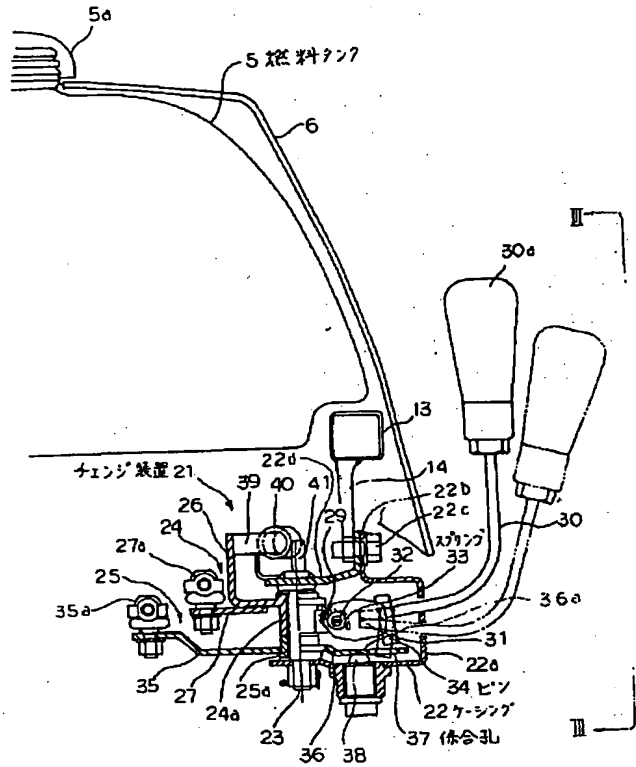
37 係合孔(凹状係合部)

43 ガイド孔

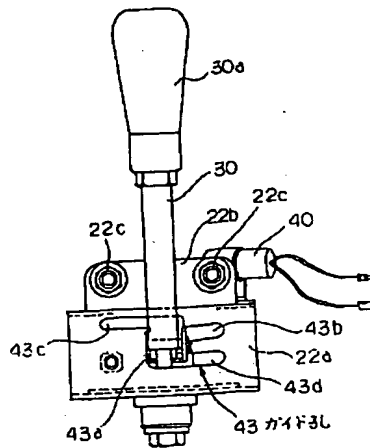
【図1】



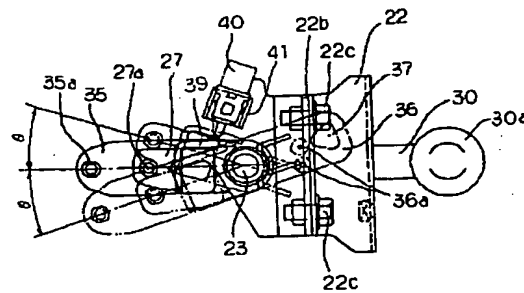
【図2】



【図3】

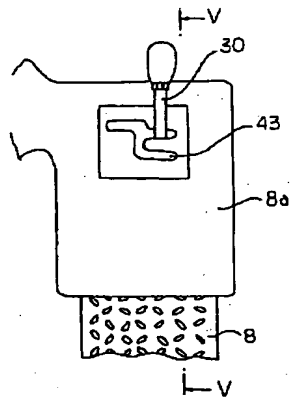


【図4】

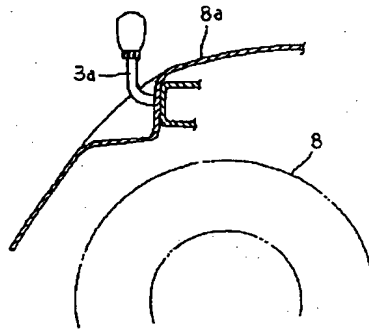


【図5】

(a)



(b)



## PATENT ABSTRACTS OF JAPAN

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B60K 20/02

G05G 9/04

(21)Application number : 07-170178

(71)Applicant : KAWASAKI HEAVY IND LTD

(22)Date of filing : 12.06.1995

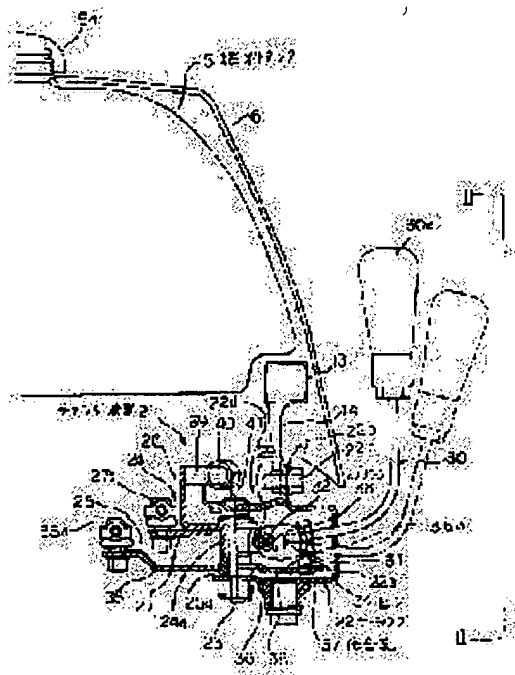
(72)Inventor : MIZUTA FUMIO

## (54) SPEED CHANGE DEVICE FOR VEHICLE TRAVELING ON ROUGH GROUND

## (57)Abstract:

PURPOSE: To provide a speed change device for a vehicle traveling on the rough ground, allowing a concurrent selection between a forward travel mode and a backward travel mode, and a changeover from a high-speed gear to a low-speed gear or vice versa, with a single lever.

CONSTITUTION: A boss section 24a forming a part of operation section of a first lever mechanism 24 for selecting forward travel, neutral and backward travel modes in a standard gear, and another boss section 25a as part of a second lever mechanism 25 for changing over the standard gear to a high-speed gear are kept adjacent to each other around a fixed shaft 23, with the boss section 24a of the mechanism 24 kept at an upper position. Also, boss sections 24a and 25a are coupled so as to be rotatable independently, and the base end of a shift lever 30 is vertically held on and connected to the boss section 24a rotatably. The end of the shift lever 30 is energized upward with a spring 33, and a vertical engagement pin 34 is secured to the base of the lever 30. In addition, an engagement hole 37 for allowing insertion of the pin 34 is formed on an arm 36 extended from the boss section 25a of the mechanism 25.



## LEGAL STATUS

[Date of request for examination] 12.06.1995

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[Kind of final disposal of application other than the examiner's decision of rejection or application converted registration]

[Date of final disposal for application]

[Patent number]

[Date of registration]

[Number of appeal against examiner's decision of rejection]

[Date of requesting appeal against examiner's decision of rejection]

[Date of extinction of right]



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## CLAIMS

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### [Claim(s)]

[Claim 1] Change over in a standard stage of advance, neutrality, and a back space, and change over with this standard stage, a high-speed stage, or a low-speed stage The 1st lever device for being change equipment of an irregular ground transit vehicle made operational with one change lever, and switching in said standard stage, While establishing independently the 2nd lever device for performing change over with said high-speed stage or a low-speed stage, respectively and connecting a change lever with said 1st lever device By operating this change lever in the direction of a right angle mostly with the change over direction to advance and go-astern in a neutral stage Change equipment of an irregular ground transit vehicle characterized by constituting so that said 1st lever device and said 2nd lever device may be combined, the 2nd lever device may become operational and change over in a high-speed stage or a low-speed stage from a standard stage can be performed.

[Claim 2] Said 1st lever device and said 2nd lever device are arranged independently pivotable on the same axle, respectively. While preparing one side of the engagement section which makes said change lever for installation and a pair rotatable to a control unit of the 1st lever device in the change over direction and the direction of a right angle of the 1st lever device in a base of said change lever Change equipment of an irregular ground transit vehicle according to claim 1 which carried out phase opposite and established another side of the engagement section in a control unit of said 2nd lever device at one [ said ] engagement section.

[Claim 3] The boss section which constitutes a part of control unit of said 1st lever device on a periphery of a fixed shaft, and the boss section which constitutes a part of control unit of said 2nd lever device While making it adjoin mutually, and covering independently pivotable, respectively and carrying out pivotable support connection of the end face section of said change lever almost pivotable in the direction of a right angle with the change over direction to advance and go-astern at the boss section of said 1st lever device A tip side of a change lever is energized in said direction of a right angle through a spring. On an arm which fixed the convex engagement section to a base of said change lever, and was installed in it from said boss section of the 2nd lever device When preparing the concave engagement section in which said convex engagement section is inserted when said change lever is operated in a neutral stage in the direction which resists said spring, and carrying out rotation actuation of the change lever in the change over direction of said 2nd lever device in this condition, Change equipment of an irregular ground transit vehicle according to claim 1 or 2 it was made for said 1st lever device and said 2nd lever device to rotate in one.

[Claim 4] Change equipment of an irregular ground transit vehicle according to claim 1 to 3 which a frame which supports that fuel tank was made to jut a part for a point of said change lever out of under said fuel tank to said hand brake lever and opposite side through a bracket, and was attached in a \*\*\*\* type four-flower buggy which has arranged a hand brake lever to one side of this bar handle while having a bar handle ahead of a fuel tank arranged ahead [ \*\*\*\* type sheet ].

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[Translation done.]

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**DETAILED DESCRIPTION**

[Detailed Description of the Invention]

[0001]

[Industrial Application] This invention relates to the change equipment of the irregular ground transit vehicle which made operational change over in the standard stage of advance, neutrality, and a back space, and change over with this standard stage, a high-speed stage, or a low-speed stage with one change lever in detail about the suitable change equipment for irregular ground transit vehicles which can run wasteland etc., such as a \*\*\*\* type four-flower buggy and a truck for agriculture. [0002]

[Description of the Prior Art] The equipment of a publication is in this kind of change equipment at JP,63-103118,U. Without forming interlocking equipment, this equipment is the thing which enabled it to position a change lever in each location of advance, neutrality, and a back space, and consists of structure which energized the lever inserted in the guide hole of a vertical sense crank form to the 1 side by the spring by the flection of a guide hole.

[0003] Since simple automatic transmissions, such as a belt type, are usually carried in the irregular ground transit vehicle on which the above-mentioned change equipment is equipped, for example on the occasion of transit in the advance location of a change lever, a reduction gear ratio is automatically changed according to change of a travel speed. However, in the reduction gear ratio only by the automatic transmission, since full speed is stopped low or becomes a high speed conversely too much, generally apart from change equipment, the switching unit from a standard stage to a high-speed stage or a low-speed stage is equipped.

[0004]

[Problem(s) to be Solved by the Invention] However, with the change equipment of a publication, following unarranging are in the above-mentioned official report.

[0005] \*\* The attachment location of the switching unit (henceforth the 2nd lever device) to a high-speed stage or a low-speed stage is needed apart from the switching unit (henceforth the 1st lever device) of order \*\* in a standard stage.

[0006] \*\* Although there are a change lever method, a switch method, etc. in the 2nd lever device, since it is necessary to operate it separately from lever actuation of the 1st lever device in any case of a method, it is actuation top inconvenience.

[0007] This invention was made in view of the above-mentioned point, and can perform change over in change over, the high-speed stage, or low-speed stage of order \*\* to coincidence with one lever, and, moreover, structure aims at offering the easy change equipment of an irregular ground transit vehicle.

[0008]

[Means for Solving the Problem] Change equipment of an irregular ground transit vehicle which starts this invention in order to attain the above-mentioned purpose a) change over in a standard stage of advance, neutrality, and a back space, and change over with this standard stage, a high-speed stage, or a low-speed stage The 1st lever device for being change equipment of an irregular ground transit vehicle made operational with one change lever, and switching in the b aforementioned standard stage, While establishing independently the 2nd lever device for performing change over with said high-speed stage or a low-speed stage, respectively and connecting a change lever with the 1st lever device of c above By operating this change lever in the direction of a right angle mostly with the change over direction to advance and go-astern in a neutral stage Said 1st lever device and said 2nd lever device are combined, and it constitutes so that the 2nd lever device may become operational and change over in a high-speed stage or a low-speed stage from a standard stage can be performed.

[0009] The 1st lever device of d above and said 2nd lever device are arranged independently pivotable on the same axle like claim 2 publication, respectively. e) While preparing one side of the engagement section which makes said change lever for installation and f pair rotatable to a control unit of the 1st lever device in the change over direction and the

direction of a right angle of the 1st lever device in a base of said change lever. It is good to carry out phase opposite and to establish another side of the engagement section in one [ said ] engagement section at a control unit of said 2nd lever device.

[0010] The boss section according to claim 3 which constitutes a part of control unit of said 1st lever device on a periphery of g fixed shaft like, and the boss section which constitutes a part of control unit of said 2nd lever device. While making it adjoin mutually, and covering independently pivotable, respectively and carrying out pivotable support connection of the end face section of said change lever almost pivotable in the direction of a right angle with the change over direction to advance and go-astern at the boss section of the 1st lever device of h above. A tip side of a change lever is energized in said direction of a right angle through a spring. i) on an arm which fixed the convex engagement section to a base of said change lever, and was installed in it from said boss section of the 2nd lever device. When preparing the concave engagement section in which said convex engagement section is inserted when said change lever is operated in a neutral stage in the direction which resists said spring, and carrying out rotation actuation of the change lever in the change over direction of said 2nd lever device in this condition, It is desirable to make it said 1st lever device and said 2nd lever device rotate in one.

[0011] a \*\*\*\* type four-flower buggy which has arranged a hand brake lever to one side of this bar handle while having a bar handle ahead of [ according to claim 4 ] a fuel tank arranged ahead [ j \*\*\*\* type sheet ] like -- setting -- k -- a part for a point of said change lever is jutted out of under said fuel tank over a frame which supports that fuel tank to said hand brake lever and opposite side through a bracket -- making -- installation -- things are made.

[0012]

[Function] With the change equipment which operates a change lever in the direction of a horizontal (width), and switches standard stage order \*\* for example, it starts this invention which has the above-mentioned configuration. Operate a change lever in the direction of a perpendicular (length) first in a center valve position, and a standard stage or a high-speed stage (or low-speed stage) is chosen. A change lever can be horizontally operated in this condition, it can switch to advance or a back space (go-astern), and the change over in a high-speed stage or a low-speed stage from a standard stage and change over of the advance, the neutrality, and the back space in a standard stage can carry out to coincidence with one change lever.

[0013] According to change equipment according to claim 2, by rotating a change lever in the change over direction and the direction of a right angle of the 1st lever device, the engagement section of a change lever base engages with the engagement section of the control unit of the 2nd lever device, and the 1st lever device and the 2nd lever device will be in a condition pivotable in one. Thereby, the change lever for change over of advance, neutrality, and a back space of a standard stage can perform change over in a high-speed stage or a low-speed stage from a standard stage.

[0014] According to change equipment according to claim 3, by the ordinary state, a change lever is energized with a spring in the direction which cancels engagement in the 2nd lever device, and the convex engagement section of a change lever is not inserted in the concave engagement section by the side of an arm. If rotation actuation of the change lever is carried out in the change over direction of the 1st lever device in this condition, a fixed shaft will be made into a medial axis, the control unit for the 1st lever devices will rotate through the boss section, and a switch of order \*\* will be performed. The convex engagement section of a base is inserted in the concave engagement section of the arm of the 2nd lever device by on the other hand operating a change lever in the direction which resists a spring in a neutral stage. Therefore, if a change lever is rotated in the change over direction of the 1st lever device in this condition, for example, it switches to an advance location, a fixed shaft is made into a medial axis, the 1st lever device and the 2nd lever device will rotate to coincidence, and change over in a high-speed stage or a low-speed stage from a standard stage will also be performed to coincidence. In addition, if a change lever is returned to the original neutral stage and the reaction over a spring is canceled, it will rotate in the direction where a change lever cancels association of the 1st lever device and the 2nd lever device according to the energization force of a spring, and the convex engagement section will slip out of the concave engagement section of the arm of the 2nd lever device.

[0015] With change equipment according to claim 4, the operator who sat down ranging over the sheet grasps and leads a brake lever by one hand, and by the condition of having operated the brake, the point (grasping section) of a change lever can be grasped by the hand of the opposite side, and it can switch to a start location (a low-speed stage advance location and high-speed stage advance location). Moreover, since it does not become obstructive since the great portion of equipment can be contained and only a part for the point of a change lever is made to jut out over the bottom of a fuel tank to a way outside a fuel tank, but it is located before the bar handle which is moreover one side, change over actuation can be performed easily.

[0016]

[Example] Hereafter, the example of the change equipment of the irregular ground transit vehicle concerning this

invention is explained based on a drawing.

[0017] III-III line view drawing of drawing 2 and drawing 4 of the perspective diagram showing roughly the condition that drawing 1 looked at the \*\*\*\* type four-flower buggy which equipped the change equipment of this example from back, the central drawing of longitudinal section in which drawing 2 shows the attachment condition of change equipment, and drawing 3 are the plans of change lever equipment.

[0018] As shown in drawing 1, in the pars intermedia of the rear wheel 2 on either side, as for the \*\*\*\* type four-flower buggy 1 which is an example of an irregular ground transit vehicle, it has the sheet 4 for taking a seat on the support frame 3, a fuel tank 5 ( drawing 2 ) is arranged immediately ahead of this sheet 4, and the upper surface of a fuel tank 5 is equipped with the tank covering 6. Immediately ahead [ of a fuel tank 5 ], a bar handle 7 is arranged in the front end center section of the tank covering 6 free [ a level turn ], and the front wheel 8 on either side is steered by revolution actuation of this bar handle 7. A parking brake lever 9 is attached in the left-hand side of a bar handle 7, and the rear-brake lever 10 is attached in right-hand side, respectively. Moreover, an engine 11 is carried down the fuel tank 5, and the foot-brake pedal 12 is formed in the 1 side of this engine 11. In addition, sign 2a in drawing is [ a front fender and 5a of a rear fender and 8a ] tank caps. Moreover, the change lever of the change equipment 21 ( drawing 2 ) which 30 mentions later, and 22a are lever coverings.

[0019] As shown in drawing 2, the change equipment 21 of this example is equipped with the casing 22 of the typeface of cross-section abbreviation KO which served as lever covering 22a, and is attached in the frame 13 on which upper limit edge 22b of this casing 22 supports a fuel tank 5 through a bracket 14 and bolt nut 22c. Between release 22d of buttress plates attached in the disconnection side lower limit section and the bracket 14 of casing 22 through bolt nut 22c sides, the fixed shaft 23 is fixed perpendicularly. Boss section 24a which constitutes a part of control unit of the 1st lever device 24 for switching advance, neutrality, and a back space to the periphery of this fixed shaft 23 in a standard stage, Turn boss section 24a of the 1st lever device 24 up, and boss section 25a which constitutes a part of control unit of the 2nd lever device 25 for performing change over in a high-speed stage from a standard stage is made to adjoin mutually, and is fitted in independently pivotable, respectively.

[0020] The L form bracket 26 is welded to the upper limit section of boss section 24a of the 1st lever device 24, and the arm 27 is welded to it on the flecion inferior surface of tongue of a bracket 26 at one. The outside edge of an arm 27 is equipped with the lower limit section of fixture 27a of a tie rod or a cable free [ level rotation ]. The bracket 29 is perpendicularly welded to the arm 27 and opposite side side of boss section 24a. A point is equipped with grip 30a and it is perpendicularly equipped with the plate 31 which welded the end face section of the change lever 30 crooked in the shape of L to one free [ rotation ] to the bracket 29 through the sideways pivotable support pin 32. And the change lever 30 is energized up through the spring 33. Moreover, near the plate 31, the pin 34 is welded to the vertical sense in the end face section of a change lever 30.

[0021] The arm 35-36 prolonged an arm 27 side in boss section 25a of the 2nd lever device 25 in the opposite side is welded to one. The arm 35 by the side of an arm 27 is prolonged to the method of outside [ arm / 27 ], and the outside edge is equipped with it free [ level rotation of the lower limit section of fixture 35a of a tie rod or a cable ]. the engagement hole 37 of the shape of an abbreviation triangle which can insert the engagement pin 34 of a change lever 30 punctures the outer edge approach of an arm 27 and the arm 36 of the opposite side like drawing 4 -- having -- moreover, the engagement hole 37 -- a little, like drawing 4, locating hole 36a opens a gap in a circumferencial direction, and is formed in it two on the inferior surface of tongue of the inside arm 36. On the other hand, in the lower part of the casing 22 corresponding to locating hole 36a, a gage pin 38 (it is also called a detent) is energized upward with a spring (not shown), and the upper limit section of a pin 38 inserts in two locating hole 36a alternatively, and positions the 2nd lever device 25.

[0022] As shown in drawing 4, when a plate 39 fixes at a right angle in the upper part of a bracket 26 and the 1st lever device 24 rotates in a back space location, the edge of the upper surface of casing 22 is equipped with the switch 40 turned on in contact with a plate 39 through U form bracket 41 like drawing 2. If this switch 40 is turned on, since a back lamp will light up or an audible tone and voice will occur, the back space of the four-flower buggy 1 can be known.

[0023] As shown in drawing 3, the guide hole 43 in which a change lever 30 is inserted is formed in lever covering 22a. This guide hole 43 consists of 43d of guide pores sideways [ to the high-speed stage change over location which extends on right-hand side from the bottom of guide pore 43c sideways / to the back space location which extends on left-hand side from the topmost part of guide pore 43b sideways / to the advance location which extends on right-hand side from the upper part of guide pore 43a of the vertical sense of a center valve position, and this guide pore 43a /, and guide pore 43a /, and guide pore 43a ] in this example.

[0024] Next, the actuation is explained about the change equipment 21 of this example constituted as mentioned above.

[0025] \*\* In the center valve position, by the ordinary state, a change lever 30 is energized up with a spring 33 like drawing 2, and is located in a standard stage.

[0026] \*\* An operator will change gears to the advance location of a standard stage, if rotation actuation of the change lever 30 is carried out to right-hand side along with guide pore 43b with the right hand, with the condition maintained of having grasped the brake lever 9 of drawing 1 with the left hand, and having operated the brake.

[0027] \*\* As for the back, the speed of the four-flower buggy 1 rises by puffing an accelerator gradually by puffing an accelerator slowly and starting the four-flower buggy 1, loosening a brake lever 9 slowly and taking off a brake. However, since the full speed in a standard stage is low, in order to run at a still quicker speed, it switches to a high-speed stage as follows.

[0028] \*\* Carry out rotation actuation to left-hand side along with guide pore 43b, and once return a change lever 30 to a center valve position. And after resisting a spring 33 and depressing a change lever 30 along with guide pore 43a, it changes gears to the advance location of a high-speed stage by carrying out rotation actuation to right-hand side along with 43d of guide pores. It can be made to run the four-flower buggy 1 in a high-speed stage by performing the same operation as the above-mentioned \*\*.

[0029] \*\* In retreating the four-flower buggy 1, a change lever 30 is returned to the original center valve position along with 43d of guide pores, and a change lever 30 returns to the center valve position of an upper standard stage automatically according to the energization force of a spring 33 by canceling the depression force. Here, if rotation actuation is carried out to left-hand side along with guide pore 43c as a change lever 30 is pushed up a little, it will change gears to a back space location.

[0030] Above, although one example of the change equipment of this invention was explained, this invention can be carried out as follows.

[0031] 1) The attaching position of change equipment 21 may be moved from under the fuel tank 5 of the four-flower buggy 1 to the upper part of the front wheel 8 in right-hand side front-fender 8a, as shown in drawing 5, and tip grip 30a of a change lever 30 may be made to project back.

[0032] 2) The configuration of the guide hole 43 may be changed so that for example, guide pore 43b and guide pore 43c may become straight line-like.

[0033] 3) It may replace with the combination of the pin 34 of a change lever 30, and the engagement hole 37 of an arm 36, and the member (engagement piece) mutually engaged in the rocking actuation to the lower part of a change lever 30 may be prepared. That is, the convex engagement section 34 can be formed in an arm 36 side, and the concave engagement section 37 can be formed in a change lever 30.

[0034] 4) In a perpendicular direction, 90 degrees of change equipment 21 are revolved, and change over of order \*\* and change over with a standard stage and a high-speed stage can be performed by actuation of the vertical direction of a change lever 30.

[0035] 5) It replaces with a high-speed stage and the gearbox of a low-speed stage is formed, and the 2nd lever device 25 can be used in order to switch a standard stage to a low-speed stage.

[0036]

[Effect of the Invention] There are the following outstanding effects in the change equipment of this invention so that clearly from having explained above.

[0037] (1) Since order \*\* in change over and a standard stage with a standard stage, a high-speed stage, or a low-speed stage can be switched to coincidence with one change lever, actuation is easy and, moreover, trustworthy. [0038] (2)

Since the 1st lever device and the 2nd lever device will be in a condition pivotable in one with change equipment according to claim 2 by rotating a change lever in the change over direction and the direction of a right angle of the 1st lever device, the change lever for change over of advance, neutrality, and a back space of a standard stage can perform change over in a high-speed stage or a low-speed stage from a standard stage, and actuation is easy and convenient.

[0039] (3) With change equipment according to claim 3, by whether the force which resists a spring to a change lever is made to act, since change over with a standard stage, a high-speed stage, or a low-speed stage can be performed, it can carry out easily [ change over actuation ] and correctly moreover.

[0040] (4) With change equipment according to claim 4, since a brake lever and a change lever can be operated to cleaning with both hands after the operator has sat down, a four-flower buggy can be started smoothly and the great portion of equipment can moreover be contained under a fuel tank, it does not become obstructive.

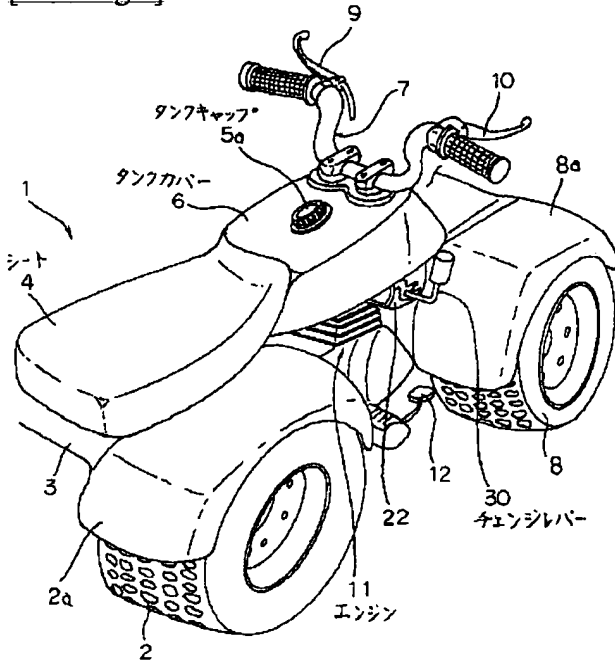
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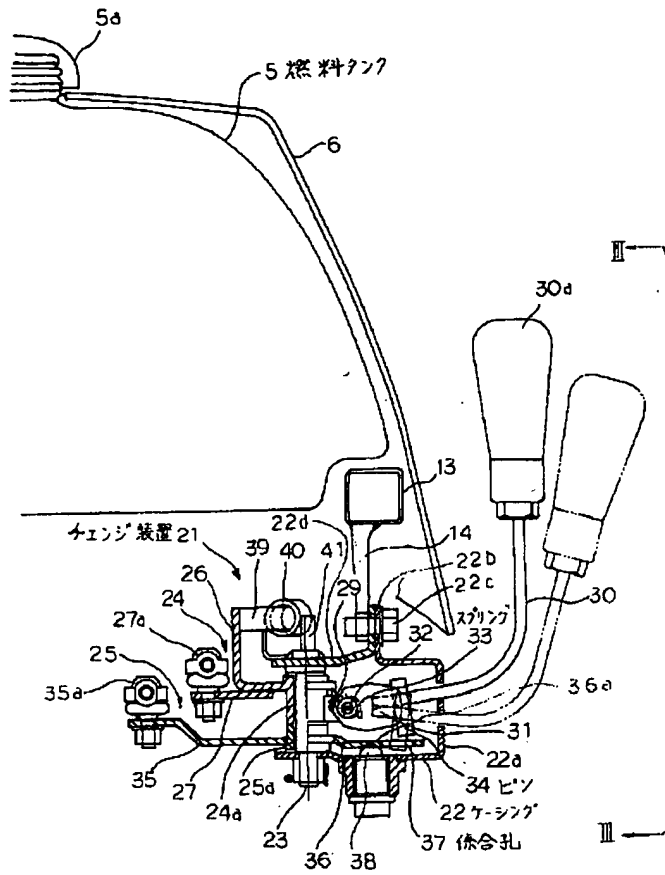
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## DRAWINGS

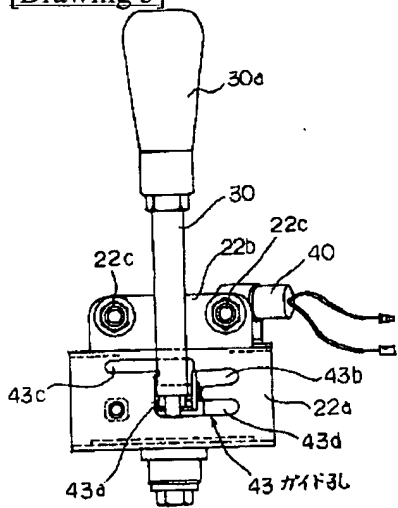
[Drawing 1]



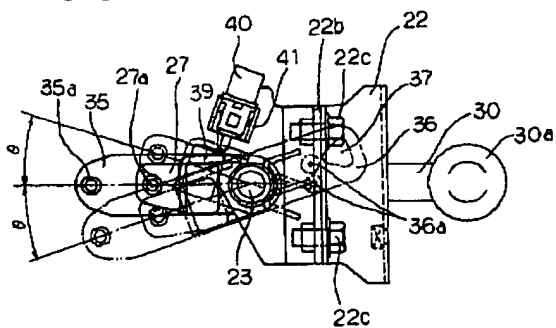
[Drawing 2]



[Drawing 3]

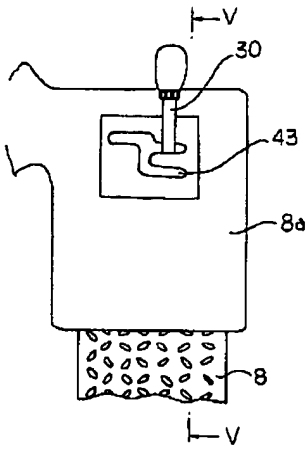


[Drawing 4]

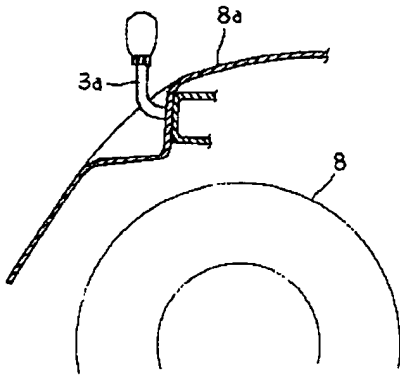


[Drawing 5]

(a)



(b)



[Translation done.]